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| **Lesson Title:**  **WORDS INTO EXPRESSIONS AND EQUATIONS**  **Writing basic algebraic expressions and equations** |
| **Subject area / course / grade level:**  **Algebra / Math / Grades 4** |
| **Introduction:**  This lesson is designed to focus on understanding variables and give students practice writing expressions and equations. |
| **Lesson Length: 60 minutes** |
| **Materials:**  Math Journals  True / False cards for the class  Symbol & number cards for small groups  Computer/ELMO  Paper, Pencil, and calculators |
| **Lesson Overview:**  Students will begin the lesson with an activity called “**TRUE OR FALSE”.** It will be followed with small groups creating their own word problems using variables, which will be shared with the class. We will continue the lesson with a powerpoint, activity with symbol and number cards, and a partner worksheet. |
| **Tennessee Standards:**  SPI 0406.3.1      Use letters and symbols to represent an unknown quantity and write a simple mathematical expression.  ✔0406.3.1 Find an unknown quantity in simple equations using whole numbers, fractions, decimals, and mixed numbers. |
| **Lesson objective/outcome(s):**  **TLW:** Demonstrate an understanding of vocabulary used in algebraic thinking.  Discover general expressions using variables to represent number patterns.  Write and solve single-step equations using variables. |
| **ENGAGE**  **Activity: TRUE OR FALSE**  Hand out the true/false cards to the students. Read out equations and have them hold up the appropriate card. At the end of this activity read out the final equation 5 + r = 12. Explain to the class that today we will be working with equations that are neither true nor false, but are “open” and have a missing number and they need to solve for that.  **TRUE OR FALSE (Equations)**  1. 5 x 6 = 45 (false)  2. 20 / 2 = 10 (true)  3. 18 – 6 = 12 (true)  4. 5 x 7 = 40 (false)  5. 3 x 7 = 20 (false)  6. 16 / 4 = 4 (true)  7. 30 – 10 = 20 (true)  8. 9 x 6 = 54 (true)  9. 45 / 9 = 8 (false)  10. 32 + 4 = 36 (true)  **FINAL EQUATION = 5 + r = 12 (neither true nor false)** |
| **EXPLORATION**  Share / demonstrate to the class the example word problem and how to write it two ways. Put your students into small groups. Have each group write 2 word problems using +, -, x, ÷ on the top of their paper. Have them solve their word problems in that same section. Then have them rewrite their problem with one part missing, but adding the answer into the problem. In the bottom section have them rewrite the same word problem with an equation using a variable for the missing part.  **Example** =  TOP = My teacher gave each of her 6 students 3 pencils. How many pencils did she need in all? 6 x 3 = n  BOTTOM = My teacher gave each of her 6 students the same amount of pencils. She handed out 18 pencils in  all. How many did she give each student? 6 x n = 18 |
| **EXPLANATION**   * Once all the groups are done with word problems, they will go back to their seats and as a class we will work each problem together on the elmo or board. We will discuss each section of their problem and talk about “clue” words needed to solve the problem. * The teacher will then show the class the powerpoint on writing an equation. Students can do the examples on their whiteboards. |
| **ELABORATION**   * Hand out the symbol and number cards to each group. Have the groups use the cards to set up each of the following expressions. After each expression, go over the correct answer with the students.  1. Jane had Δ apples and Sue had ☐ apples. How many apples did they have in all? ( Δ + ☐ ) 2. John had Δ dollars. He bought a shirt for ☐. How much money does he have left? ( Δ - ☐ ) 3. Tom had ☐ pencils. He found Δ more. How many pencils does he now have? (☐ + Δ ) 4. Sam bought **☐** movies and each one cost Δ. What was the total cost of the movies? (☐ x Δ) 5. Ben had ☐ pieces of candy. He gave each of his Δ friends an equal amount. How much did each friend get? (☐ ÷ Δ ) 6. There were Δ beans in the bag. Now there are 6 less. ( Δ - 6 ) 7. I started with ☐ books. I bought 5 more. (☐ + 5 ) 8. Kate had $35. She shared her money equally among her Δ friends. ( 35 ÷ Δ ) 9. Bob get $5 for each A on his report card. He made ☐ “A’s”. ( $5 x ☐ ) 10. Pam has ☐ pairs of shoes. She gave away 5 pairs. (☐ - 5 )  * Have them work in pairs to do the worksheet on writing basic algebraic expressions. Go over these worksheets. |
| **EVALUATION**  Teacher/student observations, worksheets, and on-going discussion. |